

ABSTRACT OF THE DISCLOSURE

5 An x-ray imaging system includes an x-ray source for projecting
imaging radiation onto a sampled object that is secured by a support member
and a detector support assembly having multiple detecting modules distrib-
uted in a sparse configuration for detecting imaging radiation that has passed
through the object. The x-ray source and the detector support assembly are
on opposite sides of the support member. Relative displacement is provided
between the object and the imaging radiation. By providing the relative
10 displacements and illuminating the object with pulses of imaging radiation at
selected intervals, a time series of successive sub-images corresponding to
overlapping regions of the object is captured by each module. Computational
algorithms combine the captured sub-images to form a composite three-
dimensional description of the sampled object. There are multiple pulses of
15 x-ray illumination for each region of the object, and each pulse irradiates more
than one detecting module.